Honey Industry.

231 263 438 The only other product of economic consequence is the celebrated Du'an honey. Honey from Jerdan has an even greater local renown but is not produced in such quantities. At places like Tarim it is not considered possible to grow honey owing to the depradations [134] of the Blue-cheeked Bee eater (*Merops persicus persicus*), one of the most common, as well as most beautiful, birds in the Hadhramaut. We did not observe this bird at all in the Wadi Du'an, where it is shot on sight.

231 263 The hives are tunnel-like structures fitted into the walls of the houses, and consist of circular sections about a foot in diameter. In the outside wall is a small hole through which the bees enter and leave the hives. Du'an enjoys two honey crops in a year; that of June, July and August being regarded as the best, for in it the bees collect the honey from the blossoms of the *'elb* trees. The honey obtained during the second crop, from November to March, is gathered from a small bush called *Qarmala*, and while it is [843] highly esteemed it is considered very heating and may not be eaten by pregnant women. If there is much rain during April and May, the bees make a black honey called *helb*, and they are said to grow much stronger, for they consume this honey themselves. The swarming of the bees was thus described by a bee-keeper: A second queen bee, whom they call *āb* or father, sometimes leaves the hive and goes a short distance away followed by some of the others. The bee-owner takes a mat and rolls it up in the shape of a hive, closing one end, and sprinkling inside a perfume of the perfumes used by the ladies. Approaching the swarm, he gently takes the queen in his fingers out of it and puts her into a small cage made for the purpose. The cage is then put inside the rolled mat. An assistant beats a tin or copper tray and the bees leave the place where they have swarmed and come to the queen. The swarm is now carried to a hive, the queen bee and her cage put into the hive, and in go the bees after her.

The bees collect the crop in 12 to 20 days, and when the owner sees the hive is full he fits on more sections until they have finished. Thirty to 40 pounds of honey are collected from a single hive at each crop. The honey is gathered by smoking the bees out from behind. When they have left, the exit hole is stopped up and the honey is taken, one section being left for the bees. In times of drought, honey is put into the hives for the bees to eat. The honey 251 is packed in comb and as liquid. In the former case two sizes of round tins are used, containing 4 lb. and 7 lb. respectively. An inside cover is soldered to the tins in Mukalla. Liquid honey is packed in cases of two kerosene tins. The value of the honey 435 in Mukalla is one rupee a pound. The total production is 90,000 to 100,000 pounds.

000 In view of the great renown which Du'an honey enjoys in South Arabia and the East Indies, and in view of the fact that it is much appreciated by Europeans, I had hoped that there might be

8: Pike N-4 (no date) 1940 MM2 Hadhramaut MM2

strangers were assumed to be enemy scouts, the advance guard of a larger fighting force behind some distant dune.

The "ambushed" caravan comprised sixteen Bedouins, only twelve of them armed. This fact, however, the theoretically opposing force was supposed not to know, since it is an unwritten law of the desert that every Bedouin travels with rifle and ammunition. Without hesitation the leader selected three armed men to act as scouts and an unarmed messenger. Hastily the four men washed down a few mouthfuls of food, since they did not know when they would be able to eat again, filled with water from the large reservoir skins some small ones suitable for short, flying trips, and then slipped swiftly off across the sand in a peculiar bowlegged glide. Under cover of a near-by dune the caravan men scrambled to its summit, at once opened fire, and drove the two intruders from view. They then dashed ahead to the dune on which their adversaries had stood and later advanced from hilltop to hilltop parallel to the caravan route and between it and "enemy" territory. In the meantime the camels had been hastily packed and started on the march along the now protected trail, which they followed without intermission until sundown.

The two "enemy" tribesmen were not seen again, and it was concluded that their actions had been misinterpreted. Freedom from molestation during the remainder of the day did not, however, cause the caravan leader to relinquish vigilance. The party was scheduled to pass at about 3.00 p. m. a water hole to one side of the trail and hidden from it by a dune. As a method of precaution an advance guard of four went ahead and, just as the caravan came abreast of this spot, converged on the well from four directions. Although the strategy displayed by the Bedouins and their chief was happily unnecessary, the "shadow" campaign showed how fearless and cautious these men of the desert can be.

Fishers and Ropemakers

During certain of the winter months sardines abound along the Hadhramaut coast, traveling in large schools, which can be seen from the shore as black patches on the surface of the sea. Natives wade out with hand nets or cast from small canoes, making enormous hauls with considerable ease. The sardines are much appreciated by the Bedouins as an addition to their diet of dates, millet, and goat or sheep meat and are eaten either raw or cooked. The fish are taken from the nets, tossed up on the beach to dry, and then packed into large bundles for transport to the interior, where they are used for camel fodder or fertilizer. Fish oil is obtained from that part of the catch which is dumped into pits and allowed to decompose. Sting rays, sharks, porpoises, and lobsters are also taken from the sea; but as the use of lobster is unknown, it is cast back from the nets.

Africa. Already interesting links are being worked out with Iran and the west Deccan. Local differences have also been worked out within both Yaman and Hadhramaut. The population of the northern part of the Yaman plateau is essentially mesocephalic, though it also shows certain features due to mixture. South Yaman, on the other hand, has broader heads. There is also a number of Jewish colonies in Yaman from whom representative groups were measured. In Hadhramaut we have a markedly brachycephalic type (very dominant, especially in the interior) and a mesocephalic one (especially on the coast). The broad heads of Hadhramaut show interesting anthropometrical features, and the roundness of their heads is primarily due to shortness (flattening of the back) rather than to width. Armenoid affinities among the broad heads of south Arabia are already known from previous observation and measurements (Bertram Thomas, etc.). The High Plateau of Yaman is practically free from prognathism, which becomes more and more marked as we go eastwards into Hadhramaut. We have reason to believe that this feature was not the result of crossing with Negroids from Africa, but represents an element brought from farther East. Special attention, however, has been paid to cases and areas of metisation between Negroid and Arab types, especially in coastal regions. Some peoples of the coastal plains of west Yaman have been shown to have marked affinities with the Negroids of Africa, who, however, do not seem to have affected the High Plateau to any appreciable extent. Certain parts of the Hadhramaut coast are equally mixed, and even in the interior there are colonies of imported elements (for example, Negro soldier-slaves, Indo-Chinese and Chinese elements as slaves and wives brought back by enterprising merchants of Hadhramaut, etc.).

Entomology

Between five and six thousand specimens have been collected, and a large number of these were actually set in the field. They represent fauna from all the altitudes we have passed through (from sea-level to 3,500 m.). The identification of our specimens will inevitably be a long process, but it is hoped that fresh light may be thrown on the question of migration between adjacent parts of Africa and Asia in these regions. One of the chief topics we worked upon was the question of locust breeding-grounds and migrations, and already some useful results have been achieved in this direction.

In addition to these topics, members of the expedition carried out side-line investigations, such as the taking of a meteorological record during the journey (with as few breaks as possible), the collection of plants and small animals in localities which have not been visited before and of fishes and aquatic fauna from all streams and springs along the way, as well as the recording of observations on the general geography and ethnography of the lands and peoples in the areas visited.

*Should there be any chance of such a separation, however, the only possibility would be that at a posterior date poorer tribes took shelter among the Sabaito-Himyarite ruins and left their obsidian industry thoroughly mixed with earlier remains. In that case the lithic industry would be still more recent than the Sabaean phase. There can be no possibility of the Sabaito-Himyarites having chosen for sites of their cities places where earlier obsidian and flint-using tribes left their kitchen midden and rubbish heaps.

16: Gardner A-4 (1937-38) 1939 MM2 Hadhramaut MM2

muddy tufa still being deposited. No living thing was seen in the pool, but dead shells of *Bulinus*, probably *truncatus*, were collected from the muddy edge. They are small and distorted, probably owing to the excess of lime.

In a wadi still farther up the lateral valley, the Wadi Sam'ua, a series of pools occurs at the foot of successive steps in the ravine bed above the Cretaceous limestone. These pools were not so deep as El Bahr and had abundant life; fish, frogs, beetles were all seen, and two univalves (a *Planorbis* and a new species of *Ancylus*).[1] The wadi narrows to a steep-sided ravine in its upper reaches; yet clinging to the side above the first pool was a mass of tufa 4 m. high. Other pools, backed by tufa cliffs with suspended stalactites, lie at still higher levels. Here exploration had to stop, but enough had been seen to establish the interest of the terrace tufa in these upper reaches.

From the above account it may be deduced that the main events in the wadi's history are as follows:

Major erosional phase, when the great Wadi Hadhramaut and its main tributaries were cut. This in all probability took place in stages. From the amount of erosion and the many changes in the wadi since its development, the time of cutting must be at least as early as late Tertiary or early Pleistocene, and may well be far older. It cannot, as has been suggested, be synchronous with the Glacial Age in Europe.

Major depositional phase, also probably subdivided into minor episodes. The valleys were filled to some unknown depth with deposits. The upper part of these is aeolian silt of palaeolithic age, which is known to overlie gravel in some areas. In the lateral wadis tufa formation had begun.

Minor erosional phase, represented by the cutting of the aeolian silt and deposition of gravel in place of silt. This can be subdivided into three parts, the 10, 5, and 3-m. terraces, also of palaeolithic age. The flood channel then followed the same restricted course as now.

It is interesting to note that these three main phases were traced in Kharga Oasis; but there, the evidence being more complete and varied, and the time of study far longer, they could be subdivided and dated with more certainty than in the Hadhramaut. No sign of a historic pluvial was seen in that part of the country which we examined.

Archaeological notes

Quaternary palaeoliths have, in the foregoing pages, been noted: on the Mukalla gravel plain; on the spurs of the *jol* near the south edge overlooking the Wadi Hadhramaut above Tarim, in positions recalling their distribution on desert cliffs overlooking the Nile valley; on and in cliff screes of the Wadis Hadhramaut and 'Amd; and in the 10, 5, and 3-m. gravel terraces of the Wadi 'Amd near Hureidha, and in the somewhat earlier aeolian silt of the valley's main filling. These discoveries of palaeoliths were no novelty, for Mr. and Mrs. Ingrams had already noted them in many places,[2] but they had not, I believe, been previously found in geological deposits. Nor must our restricted

[1] All shells from the Hadhramaut have been given to the British Museum. Major Connolly is kindly identifying them and will publish the results in his forthcoming work on the shells of the Yemen collected by Dr. Scott, of the British Museum.

[2] *Geogr. J.* 92 (1938) 306.

18:Ingrams G-3 (1934-36)1938 MM2 Hadhramaut MM2

and here we stopped on our first journey up, dispossessing a large band of monkeys. This was the first time I had seen them so far east, though we have often seen them north of Aden. As a matter of fact, one rarely meets mammals apart from gazelles and foxes in the Hadhramaut, though lately I was offered a hyena pup in Tarim, and there are wolves, ibex, and oryx. Others prefer for lunch at Reida a house not far away, where if you give an order in advance you can obtain quite well-boiled rice and boiled meat. Our superior friends in the Hadhramaut have named the place Shepheards, principally I think because you are always overcharged there. The first time we passed through the village somebody asked my wife for medicine and was given Epsom Salts. Crowds then came out and stretched forth supplicating hands which were all filled and in this way a pound or two was distributed, but there has never been any ill-feeling about it and relations with the tribe have been uniformly friendly. They have a large tree which is known as the Sanctuary, and under it all the important tribal conferences are held. Here I sat with the elders on a subsequent visit and they signed the general Hadhramaut three-years' truce.

A little beyond Reida you pass into Kathiri territory belonging to the Al Jabir, and the road p[illegible]ar Risib, where there is a landing-ground. The people of Risib have h[illegible]y bad reputation for caravan looting and holding up cars; indeed they fired on cars before ever we came into the country. They were punished for an offence of this nature and are now genuinely among our best friends. My wife and I have stayed with them at their invitation and they entertained us lavishly in their simple way. They told me that they had always believed themselves to be under the protection of the Sultan of Turkey; now their only request is to be helped to find water, and I very much hope that before long it will be possible to help them, as they depend entirely on rain-water and when their pools dry up they have to leave their homes and wander away with their stock elsewhere.

The last sign of permanent life on this road is a little beyond Risib at Heru, where there are a few Sheikhs who have some popular water-holes which last longer than most others on the road and are generally much surrounded with stock. It was a wonderful sight near Heru last year after the heavy rains to see the shallow wadi green from side to side, winding away in each direction apparently fully cultivated. The people never cease to talk of the blessing of peace through which they are able to cultivate far more than they were before, and those heavy rains are universally attributed to the mercy of God manifested as a reward for the peace.

From Heru to Tarim takes four hours and the road is absolutely desolate. Caravans follow a wadi route into the Wadi 'Adim where there is water, for there is not a drop to be had on the route that the cars have to follow, and of course it is usually on this part of the road that one has breakdowns.

I arrived at Tarim at 8.15 in the morning. The *'aqaba* leading down to Tarim is one of the most remarkable engineering constructions in the world. People who know say that no European engineer would attempt it. It consists principally of hairpin bends which you have to reverse to get round, and parts of it have gradients of about 1 in 3 or 4. If you fire a rifle at the top of the *'aqaba* it lets Tarim know you are coming and the whole place troops OUT TO MEET YOU.

24 Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

green. The eyebrows are shaven off and a finer line is painted in. The hair is shaven off all round the edge and greased stiff and pasted against the skull. All sorts of variations in the use of the above-mentioned aids to beauty are possible. To our taste the result is often more than ugly, not to say terrifying.

Never again were we received with so much friendliness and with so little prejudice by Bedouin women. On later occasions they generally ran away screaming at our approach or hurled furious invectives at us. The people of this Ḥaiqī tribe seemed to know so little about their own religion that they were not yet infected with prejudice against *Naṣrānīs*.

Close to this camp the R.A.F. from Aden have made a landing ground for forced landings. The corners and the centre are marked out by broad lines of chalk. The big aerodrome is on the coast near Fūwa, about three hours South-west of Makalla, and somewhere in the neighbourhood there is said to be a third one.

On the coral terraces grow jathropha and in the depressions aerva, a little bohar, and also incense bushes. There were swarms of young yellow grasshoppers all over the bare rocky ground. The path runs downwards towards a wādī, where fresh water from the Ghēl Bā Wazīr and salt water from the sea meet and mingle.

The village of Sheḥēr lies on the further shore and is said to have 1500 inhabitants, who live in mud huts. In a prominent position above it stands the chieftain's house, which is, at the same time, the villagers' fortress for defence against attack. A couple of rusted cannon lie on the terrace in front of the house. There are loop-holes on every floor in the thick mud walls and the window openings are small. Shēkh Elmās is to be our host: he receives us in a friendly way in his *madjlis*[1], and, at our request, is at once ready to have quarters prepared for us on the roof, but we have to wait till the women

[1] *Madjlis* (مجلس), lit.: "the place where one sits", and has come to mean: the reception-room, meeting, or company.

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

6. ALONG THE BEACH TO ESH-SHIHR.

That night in Sheḥēr there was not much sleep, for a wedding was being celebrated in the village square below us. Several houses are lighted up, and, from our vantage-point high up above them, we can see the feasting that is going on there. Afterwards by the light of gasoline lamps there is dancing in the square; the men and women stand facing each other in long rows, which approach each other with rythmical stamping of feet and clapping of hands and then again retreat. All unite in the singing of a monotonous refrain, the constant repetition of one and the same melody. The actual song is recited by a single person. They all know the old songs and enjoy taking part in them and joining in the rising enthusiasm caused by their refrain. Sweat pours down the naked chests of the men, but it is nearly morning before their energy is exhausted and the festal joy quietens down.

Our driver wakes us up with a toot from his horn in front of the castle, before it is yet light. He knows that we must do the journey to esh-Shiḥr and back, by way of the coast, before high tide.

Our host accompanies us. The road runs along the east bank of the wādī right up to the coast, which is at a distance of only a few miles. On the beach lie the heavy boats of the fishermen and of the men who collect guano. There are drying-places for fish close to some huts: we could smell them that night in Sheḥēr. The guano is conveyed by camel from here to Ghēl Bā Wazīr, there to be used for manuring the fields. The shore is very like the sandy beach of Holland and there are even dunes with some vegetation, which are, however, not more than 20—30 feet in height. On the beach there are armies of crabs, which, at our approach, try to escape either in the direction of the sea or towards the sand-dunes, where cone-shaped heaps of sand flank the entrance to their long spiral passages, which lead underground. The ridge of dunes, which

24:Meulen and Wissmann T-3 (1931)193 MM2 Hadhramaut MM2

387 is only a narrow one, is bro some places by breaches
136 through which at high tide the sea water streams. These gaps
487 have doubtless been made by the rainfall from the mountains farther inland seaking an outlet to the sea. Close by esh-Shihr coral rocks jut out above the level of the sand, and the passage there is narrow and vanishes completely when the tide is at flood.

361 Esh-Shihr lies on a wide flat sea coast, which slopes only very gradually so that steamers have to anchor far out at sea. At the moment several sambooks are lying there and fishermen are plying their trade till far away to the horizon. The track runs through deep, loose sand from the beach to the gate, which is new, but lacking in taste architecturally. The wall is also new and is strengthened on the inner side with buttresses of mud bricks, but the garment is too large for what it has to cover, and a half-dead town is pining away within the walls. Many blocks of houses are uninhabited, some have even fallen in. One crosses great open spaces on the way from the west to the east gate. The streets are dirty and even the inhabited houses have a neglected look. Over the whole town, and stronger even than the sewage smell of the streets, hangs
344 the stench of drying, half-decayed fish. The Government
361 buildings are in a square situated in the western part of the town. The castle stands on a sandy eminence by the sea; the
346 building has just been restored and, with its simple, strong lines makes a good impression. The bottom floor is being used temporarily as a school for three to four hundred boys. On the hill near the fortress some old, big cannon are lying, and a solitary signal-mast stands there. The Governor's house, a large, tall, well-constructed building, whose many roof-terraces are well suited to the sweltering, damp climate of esh-Shihr, stands on the land side of the square. The Governor is not at home, for we have met him on the beach in his fine, American motor-car. He looks Indian, and too modern for his town, nearly cut off as it is from the outside world and still dreaming of former glories. At one time, esh-Shihr was larger

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

system of drinking- and at the same time cooling-bowls, among poor and rich alike.

Our host spoke with longing of beautiful, rich Java and of the good years that he had passed there, and it was obvious that he would have liked to return there but for leaving his family behind, for the Ḥaḍramī woman does not leave her country with her husband. It was clear, from the friendly farewell, that I had not been wrong in thinking that my years passed as a civil servant in Netherlands India would facilitate my travels in Ḥaḍramaut.

They all went a little way with us to see us off and were photographed at their own request. We followed the broad *sēl*-bed [1] crossing the plateau surrounded by terraces of about 300 feet high. There, where the plateau ends, lies, at a height of 50 feet the village of Ḥimem on a hill at the edge of the wādī to which it gives its name. At the foot of the hill, there are very tall coco-nut trees, the last that we shall see for the time being, for the altitude is already 3000 feet. A conduit full of water, fed by little springs at the edge of the wādī, irrigates fields of *dhura* and of neatly-planted and well-cultivated tobacco. It is true that it is not first-class Ḥumūmī tobacco that is raised here, but even so it commands a good market price.

The evening falls and we are obliged to camp soon after leaving Ḥimem. The valley has here penetrated into the sandstone and the conglomerates under the eocene limestone. Here at a height of 3000 feet the nights are already cold. According to our Bedouins, who are good water-tasters, the water also improves in proportion as one gets further away from the coast; all salt and bitterness gradually disappears from it.

In our bivouac at Ḥimem we had to put away again a great harvest of plants and insects; the swallow-tail butterfly was also found here.

The mayor of Ḥimem came to visit us in our camp. He told us that his village of 200 to 300 inhabitants grows tobacco,

[1] The bed through which the water flows for a short time after rain.

24: Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

formation. They belong to the plateau called *djōl* (جول), lying between the mountainous coast region and the great depressions of inner Ḥaḍramaut.

6. THE DJŌL.

Our way now led over the *djōl* as far as Wādī Dō'an. The *djōl* consists of vast table-lands of reddish-brown limestone, where flat-topped, horizontal mountains, the remains of old, still higher plateaus, stretch like long wings. The wādīs are cut deep into them. We also often descend into flat, basin-shaped, wide depressions, passing over the crumbling edges of the plateaus, and afterwards have to climb laboriously up again, towards the boulders at the edge of the opposite plateau, quite half an hour away. Wherever one looks one sees the same long, horizontal lines of the table-mountains, with everywhere the forked, precipitous incisions made by the wādīs. The plain is strewn with sharp fragments of limestone, dark-brown and black in colour, which ring like metal whenever the passer-by kicks pieces of them together with his foot. Vegetation is almost absent. Towards the edges of the plateaus, against which clouds sometimes seem to break, there are a few shrubs of small, crooked, gnarled acacias. One finds no trace of animal life except a few lizards and sometimes a solitary bird. It is very warm on the *djōl* during the day, the sun scorches, and the wind is hot and dry. During the night this same wind is cold and penetrating, so that one wakes up and remains awake longing for the warmth of the sun hours before it rises; then an hour later it is torment again from the heat.

The endless monotony is the great enemy of the traveller over the *djōl*. The light is fierce and is reflected a thousand times in the metallic shining stones. The narrow camel path winds like a smooth and shining ribbon through the unruffled and almost unchanging expanse. The stones have been pushed aside by the feet of the camels which, in the course of so many years, have passed that way. The limestone of the plateau

24: Meulen and Wissmann T-3 (1931) 1932 MM2 Hadhramaut MM2

finest house in all Wādī Dō'an and that we must come and see it without fail. They were born in Addis Abeba of Abyssinian mothers; there, by trading in skins, their father had made the money with which he had built his house. The boys refused to be sent away until they had extracted a promise that we would come on the morrow.

3. THE DAYS SPENT IN WĀDĪ DŌ'AN.

The nights in Wādī Dō'an are said to be cool; 34.2° C. is certainly not cold, but the atmosphere is dry and we can all sleep on the roof though mosquito-nets are necessary. The bathrooms and lavatories in the houses make good breeding-places for insects. Flies also, during the day-time, are more numerous than we could wish.

On the following morning, May 16th, Bā Ṣurra sends us a real Arabian breakfast: a heavy bunch of fine dates in a basket, a tin entirely filled with honey in the comb, the famous honey of this country and one of its few articles of export, further, pine-apple in water made in a Chinese fruit-preserving factory at Singapore and, in a flat basket, a pile of Ḥaḍramī bread, thick pancakes of flour, just baked and still warm from the fire. This bread is saltless and rather heavy, but has a clean taste, but when cold it is as tough as leather. It tastes better and is more digestible than the bread which the Bedouins make, and bake in hot ashes. This latter is of the size and shape of a man's hand (thus about an inch thick) and is generally burnt outside and underbaked inside. It looks red or yellow according to the kind of *dhura* or *dukhn* of which it is made. After breakfast we go together to the *maṣnaʿa* to negotiate arrangements for our further journey and to collect, in the course of our talk, information about this region. Our Sēbānī people will remain here with their camels and donkeys, for we must take with us animals accustomed to go through the wide, level wādīs.

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

entrusted by his uncle Sayyid Abū Bakr with the carrying out of these aviation plans.

On the morning after our arrival we were, first of all, shown the so-called "wild cow" [1], a present to Sayyid Abū Bakr from some Bedouins who had caught it young on the border of the Rubᶜ el-Khālī (the "Empty Quarter"). The wild cow appears to be a white antelope with black marks and two very long, straight horns. The beautiful, big creature has already lived in captivity for twelve years and looks well on it, except that its hoofs, owing to lack of abrasion, have grown too long.

On the ground floor of Sayyid Abū Bakr's house, where he has his stables, we found some stones with inscriptions on them, brought by Bedouins from the ruins of Sūne. This drew our attention towards that district of ruins, and our host promised that he would organize an excursion for us there.

3. THE PALACES OF TERĪM.

Later we pay a visit to Sayyid ᶜUmar bin Shēkh el-Kāf, the younger brother of our host, already mentioned, whose house, just restored, is said to be the most beautiful in all Terīm, and that is saying a great deal in this city of palaces. His house is chiefly conspicuous for its dimensions and colour. The outside is painted deep blue, and the stately rows of tall windows are bordered with a design in yellow. There is, also, no sparing use of pink and green. The style is more Indian than Ḥaḍramī.

All the great houses of Terīm have a character quite of their own that one does not see in the other towns of Ḥaḍramaut. They are massive, square buildings, with regular rows of tall windows, with few extensions on the roofs and few decorative designs on the top of the walls or on the parapets. The lower floor, which is very lofty, has generally two wide, high entrances, closed by doors of teak, and with broad

[1] *Baqarat el-waḥsh* (بقرة الوحش).

24:Meulen and Wissmann T-3 (1931)1932 MM2 Hadhramaut MM2

To expedite matters we take the risk of starting off in advance on our donkeys. As we pass we see at a great distance some villages almost entirely in ruins, and also castles of the type of that of Qasam. There is water here and there in the deep and by no means wide *sēl*-bed. It appeared soon after we left ʿĒnāt and it increased further towards the east. This water is pretty bitter, though in some places it is sweet enough to be drinkable. The inhabitants prefer the well-water, which is better, but the pack-animals drink the water of the river. It is running and every now and then disappears to continue its course underground. Beyond Qasam the wādī is still wide and the soil consists of a thick layer of loess. The broad path winds between bushes of fresh green *rāk* covered with bluish-red berries, which are being gathered here and there by children. When we heard that they were eatable we tasted them; they have the taste of cress, sweet but hot as pepper. They have a strong laxative action as have the leaves for which camels and donkeys have a liking. Where *rāk* grows the animals are given nothing else, although they get diarrhoea from it. In journeying through *rāk* districts one sees the rumps of the camels smeared with greenish pap, whilst their leaders and riders are not free from splashes sprinkled round by their animals' tails. At these times a very unpleasant smell clings night and day to the caravan.

The further we go, the more barren becomes the bed of the wādī, which is still very wide. The layer of loam is covered with sand; mounds of loam rise up out of it, some of them covered with vegetation. Shortly before sunset we enter a region of many and magnificent ruins. It is too late to examine them closely, and we pass the smaller mounds by so as to go on to the central ruin of el-ʿUrr. This is visible when we are still far from it. Massive remains of walls, towering high against the evening sky, stand on a lonely mass of rock, right in the midst of the wādī level. The rocky hill extends some distance and is very steep, and it is difficult to clamber over the rubble of the building, which has

3:Royal Institute of International Affairs U-4 (no date)1954 M1 Middle East
Hadhramaut MM2

248 1950–1, with a quality considered equal to that of the Sudan, and a contract lasting until 1955–6 has been secured with the British Raw Cotton Commission. This irrigation has, however, [136] created a new problem in the establishment of a semi-permanent population of desert locusts where they were formerly sparse.[1]

Education

871 658 872 [212] Until the opening of the Aden Protectorate College for the Sons of Chiefs in 1935 there had been no government provision for education. In the Hadramaut, and especially in the towns of Sayun and Tarim, traditional Islamic education had reached a highly advanced stage about a century ago and produced a body of Islamic scholars; but in other parts of the Protectorate the people were mainly illiterate. Present educational policy is that, as each state becomes sufficiently advanced, it should be helped to set up a self-supporting department of education with village schools, central primary schools, and intermediary or secondary schools in the larger states. The number of pupils attending schools supervised by government or local government authorities had risen from not more than 100 in 1939 to about 6,700 by 1951. The total expenditure on education in 1949–50 was about £39,000, of which the Quaiti state contributed 54 per cent, the British Government 36 per cent, and the remaining states about 10 per cent. There were then 74 primary boys' schools, varying from the small Koran school to those of full primary status; about half received British financial help. The Aden Protectorate College for the Sons of Chiefs was being closed down as the newer primary schools reached the desired level. There were seven girls' primary schools in the Eastern Protectorate and one in the Western, with a total attendance of about 800. In each Protectorate there was one post-primary school, with Egyptian and Sudanese teachers on the staff. A junior secondary school at Ghail ba-Wazir near Mukalla was completed in 1950 to provide a two-years' course for the local administrative service, the police, and the army. Full secondary education in Aden Protectorate is unlikely for some years, but the new Aden College, a secondary school opened in 1951, receives boys from the Protectorate as well as from the Colony and will it is hoped eventually be developed to university standard. In 1950 ten Protectorate boys held scholarships in the Sudan, and some twenty from the Eastern Protectorate were studying in other Arab countries.

[1] Dr B. P. Uvarov, director of the Anti-Locust Research Centre, reported in *The Times*, 27 September 1952.

29:Dunn S-4 (1952)1952 MI Middle East

Hadhramaut MM2
Aden MM1

COTTON IN ARABIA

H 248 136 242

PESTS AND DISEASES

"At first, as was to be expected, the cotton crop as a whole was remarkably free from major pests and diseases, but these are now beginning to appear. Bacterial blight *(X. malvacearum)*, has not so far been evident, the land having started clean and the seed having been introduced from Tokar where the disease is not prevalent. The almost complete absence of rain during the growing season also makes any secondary spread of the disease unlikely.

"Jassids are present in small numbers and may tend to increase, and American bollworm *(Heliothis armigera)* is beginning to appear in quite large numbers in Abyan.

"At Lahej the most serious pests are the red bollworm *(Diparopsis castanea)* and the pink bollworm *(Platyedra gossypiella)*.

H 248

PROSPECTS

"It is unlikely that production of cotton in the Aden Protectorate will ever be on a very large scale as the area of land which can conveniently be flooded is limited. At present some 30,000 acres are in use in Abyan, of which 9,000 are under cotton and the target, when all proposed canals are finished, is about 50,000 acres, with cotton on about 20,000 acres in a good flood year. With developments in other areas the total area under cotton may be extended to 30,000 acres.

H 654 242

RESEARCH AND EXPERIMENTATION

"The Senior Entomologist of the Empire Cotton Growing Corporation, at the request of the Director of Agriculture, visited Aden in January 1951 to make a survey of the insect pest position, and the Corporation's senior officer in the Sudan is now spending half his time in Aden pending full time employment by the Abyan Board later. He has started selection work on the X1730 A seed from the Sudan and is arranging for regular supplies of pure seed to be produced in the area. In addition other strains are being tested in the variety trials and observation plots, including a strain of Wilds which matures very early and occupies the land for only six months. If this proves successful it might enable a food crop to be grown in the same year as the cotton crop.

"A Colonial office mission also visited Aden early in 1951 to examine the technical, agricultural and financial problems involved and to make recommendations for the development of the scheme and the establishment of any research work that may be needed."

A 101 [161]

ADEN

The crown colony of Aden located on a tiny peninsula on the coast of the protectorate actually dominates the area. Though the colony is only 75 square miles in area it has almost 100,000 people. The port of Aden has been an important trading center since the time of the ancients. This was the crossing point for the Abyssinians as early as 3,000 B.C. It was the final port of call for the Indian traders in the same century. It was also a chief port on the Indian trade route during the Roman times. Today Aden is the principal port and the commercial center for the entire Arabian Peninsula and one of the main crossing points for the African Moslems trekking to Mecca.

mosques and to storage tanks from which the commercial carriers draw water for sale to the inhabitants. Most well supplies are unprotected and exposed to subsoil and surface contamination. The ablution pools in the mosques are often heavily polluted and serve as vehicles for the transmission of intestinal infections. They also provide conditions favorable for the breeding of anopheline and other mosquitoes; also of Planorbis and Bulinus snails.

There are numerous small irrigation projects in the agricultural districts, especially in Western Aden Protectorate and the Hadhramaut, many of which have been in use for decades. They depend upon water from streams or wells and, in some parts of the highlands, from spring-fed cisterns. Pumps have been introduced in the modern developments, but in most instances water is drawn from streams and wells in the traditional manner, namely, in leather buckets by means of ropes pulled over wooden pulleys by men or animals.

Waste Disposal

The methods of sewage disposal are primitive. Septic tanks, which discharge into the main drainage system, are connected with some of the newer houses in Aden Colony, but pail privies provide the usual means of sewage disposal in both Aden and Sheikh Othman townships. In old buildings with several stories, soil pipes which may be 40 feet in length lead from the privies on the upper floors to containers below. The night soil is collected regularly from private and public latrines by the town authorities and conveyed to incineration plants. Pit latrines are employed in some quarters, but they are being abolished wherever possible. In the congested districts, the latrines are located along concrete passages between the rears of the houses and are drained to storm sewers or to soakpits. The construction of a modern sewerage system for the Colony is under consideration.

The "long drop" method, in which closet

H 364 shafts lead from lavatories in the upper stories to a reception chamber on the ground floor, is widely used in the larger houses in Western Aden Protectorate and the Hadhramaut. Pit or surface privies are sometimes found in the courtyards of the smaller houses, but the majority have no facilities for the disposal of sewage wastes. Indiscriminate pollution of the soil is a general practice.

Fauna and Flora

A 659 Few entomologic surveys have been made in this region, and data regarding the insect vectors and animal hosts of human disease are fragmentary. It is probable, however, that the species identified in the neighboring territories are present in Aden Protectorate under similar physiogeographic conditions.

A 136 164 Arthropods. Mosquitoes. *Anopheles adenensis* (— *A. culicifacies adenensis*) is the most important anopheline mosquito in Aden Colony. Although it has been eradicated from Aden and Sheikh Othman townships, it persists in near-by oases, and is a major vector of malaria wherever it is encountered. In the last local outbreak in the *kutcha* hut district of Sheikh Othman, *A. adenensis* was found breeding in large numbers in the soakpits. It normally breeds A [744] in wells, shallow cisterns, irrigation canals and sluggish streams, and, before the institution of effective control measures, had become adapted to the high salinity of the saltpan seepages.

H 136 164 *A. gambiae* is widely distributed in the Protectorate, where it probably acts as the principal vector of malaria. It breeds along the edges of pools and streams, in irrigation canals, in wells and in numerous other collections of water. *A. turkhudi, A. coustani, A. d'thali, A. pretoriensis* and *A. barbirostris* have also been reported from various localities.

Aedes aegypti, the usual urban vector of yellow fever elsewhere, and *A. vittatus*, a tree-hole breeder implicated in the transmission of yellow fever in endemic foci in

H 136 164 Africa, are found in the coastal area. Numerous species of *Culex* are present, including *C. quinquefasciatus* (— *C. fatigans*), a potential vector of filariasis. A species of *Taeniorhynchus* has been described from Western Aden Protectorate.

A 744 136 Mosquito control measures have been carried on by the health authorities in the Colony for several decades. They involve weekly inspections of all premises to eliminate breeding sites, the protection and the larvicidal treatment of permanent bodies of water, the reclamation of swamps and low-lying lands in the vicinity of the towns, and the supervision of the dhows using the port. The Aedes index was 0.014 per cent in 1950, in contrast with 4 per cent in 1930.

A H 136 361 511 Flies. Flies are abundant in towns and villages, where the insanitary conditions around markets, cattlesheds and dwellings favor prolific breeding. They are most numerous between November and March. The house flies, *Musca domestica* and related species, are ubiquitous and undoubtedly play a role in the spread of intestinal and eye infections. The stable fly, *Stomoxys calcitrans*, is prevalent. Sandflies are numerous, among which *Phlebotomus papatasii* is presumably of primary medical concern. The tsetse fly, *Glossina tachinoides*, was reported early in this century from the Haushabi and the Subeihi tribal districts in Western Aden Protectorate.[9] It has not been collected in recent surveys, however, and the original observations remain the only record of its appearance outside Africa.[20]

A 136 744 Campaigns against flies, employing DDT, Gammexane and other insecticidal sprays in markets and public buildings, are undertaken periodically by the health authorities in the two townships of the Colony.

A H 136 164 Lice. All forms of human lice are found, particularly among the inhabitants of towns and villages in the interior. *Pediculus humanus corporis* is prevalent in the highland villages, where it is the vector of louse-borne typhus and louse-borne relapsing fever.

Fleas. Both *Xenopsylla cheopis* and *X. astia* parasitize the rats in this region.

They are potential vectors of plague, but no cases have been recorded for several decades. The human flea, *Pulex irritans*, is common and has been suspected of transmitting plague from man to man in past outbreaks. Species of *Ctenocephalides* undoubtedly occur, as in the adjacent territories.

Ticks and Mites. Several species of ticks infest both wild and domestic animals in the rural areas. The human itch mite, *Sarcoptes scabiei*, is unusual among the schoolchildren in the Colony, although it is widespread in the poor communities in Yemen and the Protectorate.

Reptiles. The puff adder, *Bitis arietans*, inhabits some portions of the western highlands. The carpet viper, *Echis coloratus*, and the sand vipers, *Aspis cerastes* (— *Cerastes cornutus*) and *A. vipera* (— *C. vipera*), are described from southern Arabia, but their prevalance within Aden territory is uncertain.

Rodents. *Rattus rattus rattus* and *R. rattus alexandrinus* are widely distributed. At least 90 to 95 per cent of the rats captured in the Colony have been identified as *R. rattus*. In spite of the diversity of shipping activities, *R. norvegicus* is seldom encountered. Active measures for the destruction of rodents in the bazaars and the dwellings in the towns and on the dhows visiting the port are carried on by the Colonial health authorities. No controls are exercised over the larger vessels, which have to anchor in the harbor. A representative proportion of the captured rodents are examined annually for evidence of plague.

Wild rodents are common, including species of *Meriones*, *Jaculus* and *Gerbillus*.

Molluscs. Foci of *Schistosoma haematobium* and *S. mansoni* infection exist in Western Aden Protectorate, but the intermediate snail hosts have not been positively identified. Planorbis and Bulinus snails have been reported from Mukeiras and Muscimir, and Bulinus from the Dhala' plateau. *Melanoides tuberculata* and other species are found in several areas.

A 165 167 854 H6 thorities regard undernutrition and incorrect methods of feeding as important underlying factors. The deaths in infants under 1 year of age totaled 175 in 1950, or about 44 per cent of the known dysentery deaths.

H 164 No precise information is available regarding bacillary and amebic dysentery in the Protectorate, but the high rate of infection among visitors to Aden Colony suggests that both are widespread.

A 164 361 744 **Cholera.** Cholera has not been reported from Aden within the present century, although outbreaks have followed its introduction in the past. Since no record exists of its presence in the Hadhramaut, it is probable that the disease was largely confined to the port towns.

During the 1947 outbreak in Egypt, traffic through Aden was increased due to the quarantine restrictions imposed on Egyptian ports. Special precautions were taken by the health authorities to prevent the admission of infected individuals or goods by sea, land or air routes. Immunization against cholera was also provided for all persons handling shipping and for all health service personnel.

A 751

N 164 **Helminthiases.** SCHISTOSOMIASIS. Schistosomiasis is endemic in scattered localities in Western Aden Protectorate, especially in the highland districts above 2,000 feet elevation. Foci of *Schistosoma haematobium* are known to exist in the Jebel Jehaf and Dhala' plateau country, in the Wadi Tiban area around Museimir, and in the vicinity of Tor am Baha, Huwemi and Khor 'Umeira. *S. mansoni* is apparently more restricted in distribution, but it is found in the Jebel Jehaf and the Wadi Tiban regions.

A 164 No locally acquired infections are reported from the Colony, although numerous cases among persons from the interior are treated in the civilian hospitals each year. A large proportion of the cases seen in Aden Colony come from Yemen or from the Dhala' and the Museimir districts.

H A 136 The intermediate snail hosts of *S. haematobium* and *S. mansoni* have not been definitely established, but Bulinus and Planor-

bis snails have been described from some of the affected foci.

ANCYLOSTOMIASIS. Hookworm infection occurs in Labej and a few agricultural centers in Western Aden Protectorate. *Necator americanus* has been identified in the cases treated at the Civil Hospital in Aden.[20]

OTHER HELMINTH INFECTIONS. Infections with one or more types of intestinal worms are prevalent, particularly among the peoples of the Protectorate. Ascariasis is widespread. Trichuriasis and, to a lesser extent, enterobiasis are common. Hydatid disease is reported among individuals from the Colony and from the interior. Infection with the beef tapeworm, *Taenia saginata*, is enzootic among the cattle in the tribal districts, and human infections are undoubtedly frequent. Cases are occasionally encountered among immigrant families in the Colony. The pork tapeworm, *T. solium*, is rare, but infections are sometimes seen in the Aden hospitals.

Other Infections. *Brucella melitensis* is enzootic among the goats in this area, and Malta fever is diagnosed from time to time in the Colony hospitals and dispensaries.

DISEASES SPREAD CHIEFLY THROUGH THE RESPIRATORY TRACT

Tuberculosis. Tuberculosis is one of the most prominent diseases affecting the inhabitants of southern Arabia, but no precise information is available, except for Aden Colony. The high degree of undernutrition and overcrowding, and the low standards of personal hygiene and sanitation prevailing among large sections of the population, favor the spread of the infection. The disease is probably prevalent among the women who are confined to close quarters by the *purdah* system and among the young children in close contact with them. In a small tuberculin test survey covering 95 Aden township schoolboys of 7 to 12 years of age, in 1945,[3] positive reactions were obtained in 56 per cent—a rate which ranks high among those usually found in

ADEN MM1
HADRAMAUT MM2

Diseases Spread by Arthropods

Malaria. Little or no indigenous malaria exists at present in the Colony. From 1,000 to 2,000 malaria patients are treated each year in the civilian hospitals and dispensaries, but, with the exception of occasional cases of questionable origin, the infection has almost invariably been acquired outside the limits of the Colony, usually in the interior. Until recent decades, malaria was highly endemic in the oasis of Sheikh Othman and surrounding villages, and sporadic outbreaks were experienced in the town of Aden. Anopheline control work was initiated in 1909 and extended on a colony-wide basis in the 1930s. As a result, the disease was early eliminated from Aden, while its prevalence was progressively reduced in Sheikh Othman. The number of local cases treated at the Keith Falconer Mission Hospital declined from almost 2,000 a year in 1907 to zero in 1950. The last outbreak of malaria was recorded in 1943 among the transient laborers living in *kutcha* hut settlements in Sheikh Othman. At that time, *Anopheles adenensis* (— *A. culicifacies adenensis*), the principal vector, was found breeding in the soakpits. Antianopheline measures are carried on continuously in the Colony and adjacent sections of the Protectorate, and vector species have been eradicated almost completely.

A 164 768 361

A 744 464 164

H A 744

Malaria occurs in most portions of the Protectorate, exclusive of the desert regions and the mountainous areas at the higher elevations. In the 1939-40 survey of Western Aden Protectorate, all gradations of endemicity were encountered. In general, the infection was hyperendemic in the vicinity of perennial streams and moderately endemic in villages around wadies which remained dry for most of the year. The splenic index ranged from 40 to 92 per cent in different localities. Extensive epidemics have been recorded from the highland districts, especially from the Dhala' and the Yafa'i country. Both *Plasmodium falcip-*

H 164

H 164 136

H 164 136 arum and *P. vivax* are found in most regions, but *P. malariae* is apparently relatively rare. *A. gambiae* is widely distributed, and is regarded as the principal vector in the Protectorate.

H A 164 Rickettsial Infections. Louse-borne typhus has been recognized in the highlands of southwestern Arabia since 1939, and occasional imported cases are admitted to hospitals in the Colony. In 1944-45, epidemics of typhus were recorded from Western Aden Protectorate which were secondary A 164 167 744 to foci in Yemen. The disease first appeared in Aden in January, 1944, among Jewish emigrants who had traveled overland from Yemen and were awaiting transport to Israel. Fifteen cases were reported, all but 2 of which were members of the Jewish community. The movement of Yemenis across the frontiers was restricted, and a camp at Lahej which at that time harbored some 1,600 Jewish emigrants was transA 167 758 744 ferred to a quarantine site in the desert. Sick individuals from the Jewish quarters in the town were removed to the camp, and wholesale delousing measures were enforced both at the camp and in infected areas in the town. The spread of the infection in the Colony was curtailed, but new outbreaks developed in the Amiri and the Subeihi tribal districts, near the Yemeni border, and progressed along the trade routes to within 40 miles of Aden Colony. The importance of the port and military installations during the prevailing war emergency necessitated the creation of a sanitary cordon to isolate the Colony from the interior.

A 164 744 The infection persisted in epidemic form in the Protectorate, spreading eastward to the Dhala' plateau and the mountainous villages of the Lower Yafa'i country. In many localities, 10 to 25 per cent of the inhabitants are believed to have suffered from the disease. Insecticidal powders, as well as antityphus vaccine, were supplied by the United States Typhus Commission, and mass dusting campaigns were carried on in the villages visited by the medical

30: Gt. Britain G-5 (ca. 1918) 1920 MJ1 Saudi Arabia
Hadhramaut MM2

Irrigation is almost entirely artificial; neither the rains nor the variable streams are in general adequate to this purpose, and watering of the soil is mainly carried on from wells. These may be sunk practically everywhere in the valleys. As in many other parts of Arabia, the water is drawn up in a leather hoist by animals, usually cows, attached to a cord which passes over a pulley supported on wooden struts; the water thus obtained is received in a large wooden trough whence it is spread over the land by means of little runnels.

Cattle-rearing is the principal occupation of the Bedouins. Camels and donkeys are reared for transport purposes; sheep for killing and for milk; cows only for milk and irrigation work; oxen exclusively for ploughing. Horses are very rare and are considered as animals *de luxe*. Bees are numerous, and much honey is produced. The wild animals most largely found are the rabbit, gazelle, wild goat, jerboa, hyena, hedgehog, a large species of lizard (permitted as food to Mussulmans), and the panther, wolf, and monkey (not permitted as food).

Trade and Commerce

The only ports of importance commercially are Makalla (see p. 232), Shiheir (see p. 232), and Seihūt (see p. 230), and even at these the trade carried on is purely coastal, with the near coast of Africa, the Red Sea, the Persian Gulf and the southern coast of Arabia, and above all with Aden and Muscat. Trade by caravan is carried on from these ports with the whole of the interior of the Hadhramaut and with the southern Arabian littoral as far as Yemen on the west and Oman on the east. Burūm (see p. 233) and Qusei'ir are small fishing villages.

There are no made roads; the routes follow the courses of the wādis or natural paths. Transport by wheeled vehicles is impossible everywhere; all is carried on by camels or donkeys. It is, however, relatively cheap; e. g. a camel from Shiheir or Makalla to Seyyūn costs only 5 florins in the good season; in summer, when forage is scarce, it is higher, but never above 10 florins.

The chief exports are dates, stuffs dyed with indigo, a superior quality of wheat, and honey; smaller exports are shells and fins of fish, the latter exported to India and China. Imports: wheat, butter, coco-nuts, coffee, sugar, rice, cotton and cotton stuffs, pottery, bars of iron and worked iron, sesame oil, petroleum, and tin-ware.